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Lessons learned will prove crucial in controlling a second wave of COVID-19

KELLY GRANT › HEALTH REPORTER
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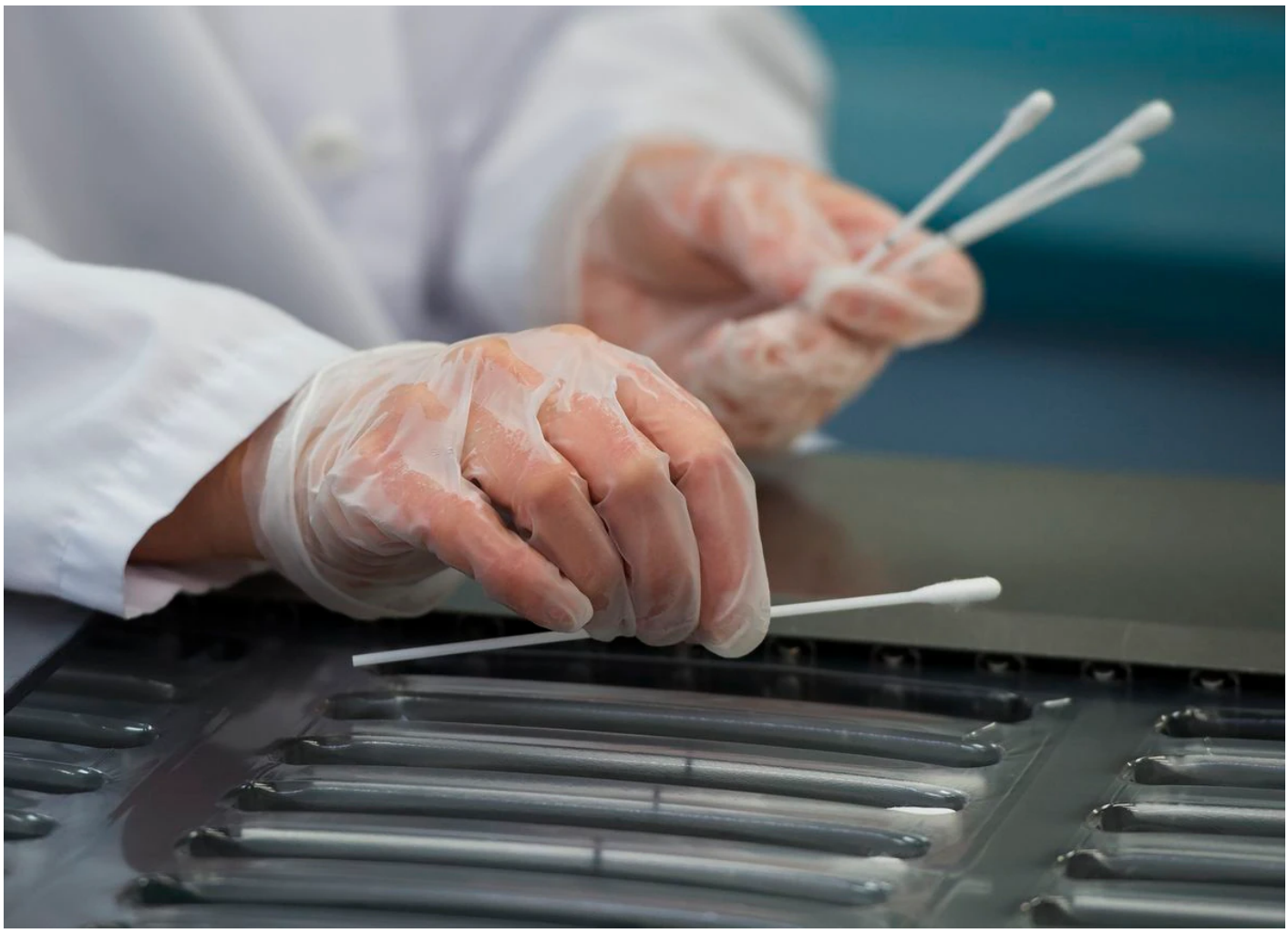

Employees at the Canadian Hospital Specialities (CHS) use dual COVID-19 testing swab kits in Oakville, Ont. on Monday, June 8, 2020. Testing, tracing and isolating works, but only if deployed quickly and only when community transmission is low.

NATHAN DENETTE/THE CANADIAN PRESS

When Canada confirmed its first case of the coronavirus in Toronto on Jan. 25, the virus was so new it didn't even have a proper name. Only about 2,000 people were known to have been infected, and 56 deaths had been attributed to the disease, all of them in China.

In the seven months since officials announced that first case at a Saturday night news conference, Canada has learned many hard lessons about the disease now known as COVID-19. More than 116,000 Canadians have been infected. Almost 9,000 have died.

Reflecting on the early weeks, Bonnie Henry, the B.C. Provincial Health Officer who became a celebrity for her deft handling of the pandemic, said it took time for the gravity of the situation to sink in. Society would have to be shut down.

"We were not quite willing to believe it – almost," she said. "And I say that myself, as somebody who spent 30 years working on pandemic planning."

Rollout of COVID-19 Alert app faces criticism over accessibility on older phones

As weeks of lockdown dragged into months, Canada "bent the curve" – that is, prevented a rush of infections that might have overwhelmed the health care system – and the country exhaled. By early July, the national seven-day average of new daily cases had dropped to 273, down from a high of about 1,800 in the first week of May. The first wave, it seemed, was over.

But as businesses have reopened and Canadians have grown weary of isolating themselves from the people they love, case counts have begun to rebound. By the week ending July 28, the seven-day average of new daily infections was 471.

"I would argue that we're in the early stages of a second wave right now," said Gigi Osler, a Winnipeg surgeon and past president of the Canadian Medical Association.

If the wave grows, as most expect it to, Canada won't be fighting blind against an enigmatic new virus. Lessons learned in the first round, if applied in the second, could help keep the coronavirus under control as schools reopen and the country heads into a long winter.

Lesson one: Masks work. If everyone wears them, they should contribute to controlling a second wave

Shoppers wear masks as they line up at a mall on the third day of Quebec's mandatory mask order for all indoor public spaces, July 20, 2020 in Laval.

RYAN REMIORZ/THE CANADIAN PRESS

Paul Warshawsky, the director of adult critical care at Montreal's Jewish General Hospital, has probably come into contact with as many COVID-19 patients as anyone in Canada. As the first designated COVID-19 hospital in hard-hit Montreal, its intensive-care unit had cared for 120 infected patients as of the last week of July.

One of Dr. Warshawsky's most important takeaways has to do with masks – but it's not the lesson you might expect. "I think one of the biggest things we've learned is how rarely an N95 mask is truly necessary," he said, referring to the fit-tested disposable respirators that hospitals around the world desperately clamoured for as infections first soared.

Paper surgical masks, coupled with eye protection, gowns and gloves, protected health care workers from COVID-19 patients just fine, Dr. Warshawsky said, as long as those workers weren't performing aerosol-generating procedures such as intubating a patient to prepare them for mechanical ventilation.

The intervention that proved far more important was universal masking – requiring all hospital staff to wear surgical masks all the time. “If you look at the health care workers who got sick,” Dr. Warshawsky said, “the majority of them got sick not because they didn’t protect themselves properly when they were in a room with a known COVID patient but because they didn’t protect themselves at all when they were in a room with a patient they didn’t know was a COVID patient or a colleague who they didn’t know had COVID. A lot of the transmission was health care worker to health care worker.”

The lesson of universal masking – that simple face coverings reduce the spread of COVID-19 if worn consistently by everyone – applies outside hospitals, too. The evidence is not airtight, but it is growing by the day. An analysis of 172 observational studies, most of them pre-COVID-19, concluded that disposable surgical masks and reusable cotton masks were associated with a degree of protection for the general public, especially if combined with hand washing and physical distancing.

A study of sailors aboard the USS Theodore Roosevelt, a navy ship that suffered an outbreak that infected almost 1,500 and killed one, found that sailors who wore masks were significantly less likely to be infected than those who didn’t.

In Germany, where mask mandates were enacted in different regions at different times in April, a study comparing the regions concluded that “face masks reduce the daily growth rate of reported infections by around 40 [per cent.]”

In Missouri, two stylists who later tested positive for the virus didn’t infect any of the 139 clients whose hair they cut while they were infected. The stylists and all their clients wore masks.

Now that cute masks are a fashion statement and rudimentary versions are sold in Ziploc bags at variety stores, it seems strange to recall that Canadian public-health officials, including Chief Public Health Officer Theresa Tam, once advised against wearing them.

Her stand changed as the evidence did – and as it dawned on everyone that crafty types could sew reusable masks that offered at least some protection without depleting the inadequate supplies of medical-grade personal protective equipment for health workers.

Now masks are mandatory in indoor public places in several major Canadian cities, which should help blunt the impact of a second wave. “It’s an extra layer of protection,” said Jennifer

Kwan, a Burlington family doctor who helped found the advocacy group Masks4Canada. “Masks should be seen as giving us the freedom to return back to normalcy.”

Lesson two: Testing, tracing and isolating works, but only if deployed quickly and only when community transmission is low

People line up for a mobile COVID-19 Assessment Centre at 1250 Markham Rd. on June 2 2020.

FRED LUM/THE GLOBE AND MAIL

The city of Kingston hadn’t recorded a new case of COVID-19 in more than a month when it confirmed three between June 20 and 24. The cases didn’t appear linked. The first patient was a nurse at Kingston Health Sciences Centre, the second a baby and the third a kitchen worker at a local restaurant, the Rustic Spud.

What happened next was a textbook example of the test-trace-isolate strategy in action, a model for how outbreaks could be snuffed out in a second wave.

Through interviews, contact tracers from the Kingston, Frontenac, Lennox and Addington [KFLA] Public Health Unit quickly uncovered the common thread. The nurse, the restaurant

worker and the baby's mother, who later tested positive, had all visited Binh's Nail and Spa, one of many beauty salons that reopened on June 12 when the region moved to Stage 2 of Ontario's reopening plan.

Health inspectors descended on Binh's, tested the workers and found that six of 10 were positive for SARS-CoV-2, the virus that causes COVID-19. The salon, which had been breaking a slew of pandemic rules, was temporarily shut down.

Medical Officer of Health Kieran Moore, armed with a marker and a paper flip chart, took to YouTube to explain how the outbreak was spreading. Linked cases were discovered among employees of two other nail salons and a golf course. "We want to be able to do our job, which is case and contact management, very efficiently and effectively," Dr. Moore said, "and that really means a 24-hour turnaround for every case from the time we receive a positive lab [test.]"

Dr. Moore encouraged anyone who thought they might have been exposed to the virus to get tested, and 13,520 tests were completed in the region between June 25, the day the outbreak was declared, and July 21.

By the end of the outbreak, 38 people had been infected, only one of whom spent time in hospital. The KFLA Public Health Unit is back to streaks of zero-case days, broken now and then by one or two new cases from outside the region. The health unit tamed the outbreak without closing nail salons en masse – a crucial lesson if businesses are to remain open through the fall.

But that lesson is much harder to apply if the number of new infections in a region outstrips contact-tracing resources or if testing turnaround times are too slow.

"Kieran [Moore] is running a tight ship in a small jurisdiction and he's proven you can do it," said David Fisman, an epidemiologist at the University of Toronto's Dalla Lana School of Public Health.

Dr. Fisman doubts bigger Canadian cities would be capable of controlling the virus in the same way, considering how some struggled with testing and tracing at the height of the first wave.

If public-health practitioners hope to halt an outbreak, they have two to three days from the time a patient develops symptoms to isolate that patient and quarantine at least 80 per cent of their contacts, according to a review of COVID-19 contact-tracing studies led by the University

of Montreal. “Less efficient tracing may slow, but not stop, the spread of COVID-19,” the authors conclude in a paper published July 25 that has not yet been peer reviewed.

Lesson three: Preserve critical-care capacity in hospitals but don’t shut down all scheduled operations again – because you can’t

A bed in need of cleaning is moved in the COVID-19 intensive care unit at St. Paul's hospital in downtown Vancouver, April 21, 2020.

JONATHAN HAYWARD/THE CANADIAN PRESS

In the early stages of the pandemic, the critical-care staff at some of Vancouver’s hospitals began noticing a hopeful trend: Their severely ill COVID-19 patients were surviving in surprising numbers, based on the frightening mortality reports out of Wuhan, Northern Italy, New York City and Seattle.

When six intensive-care units in Metro Vancouver crunched their COVID-19 numbers, they found overall mortality was 15 per cent, significantly lower than early studies from China and Italy that showed mortality ranging from 26 to 62 per cent in patients made critically ill by the virus.

The Vancouver patients were, on average, no younger or healthier than patients in the Chinese and Italian studies, said Anish Mitra, a critical-care physician at Surrey Memorial Hospital and one of the authors of a report about the Vancouver data published in the Canadian Medical Association Journal.

The difference seemed to be that Vancouver's ICUs were never overwhelmed by COVID-19 patients, Dr. Mitra said. "We were able to ensure that patients who were critically ill all received an ICU bed and they all received care from an ICU nurse who was [doing] one-to-one nursing," he said.

The steps Canada's health care systems took to free up ICU capacity saved lives, according to critical-care specialists. Even in Montreal, where case counts were far higher than in Vancouver, hospitals kept mortality rates somewhat in check. At the Jewish General Hospital's ICU, the COVID-19 mortality was 21 per cent as of the end of July, according to Dr. Warshawsky.

Canada's major critical-care units had enough staff and equipment to widely adopt measures such as turning patients on to their stomachs, which helps people survive severe respiratory illness, studies show. With their faces turned to the side and one arm stretched forward, like swimmers in mid-stroke, patients in the prone position are able to achieve a better balance of blood and oxygen flow in their lungs, improving oxygenation.

"But the truth is, it was a pain to do," said Niall Ferguson, head of critical care at the University Health Network and Sinai Health System in Toronto. Before the pandemic, "the joke, especially in North America, was that it would take a team of 10 to prone a patient – five to actually do it safely and another five to stand around and complain about how difficult it was."

That attitude changed with COVID-19, he said.

Dr. Ferguson also said Toronto General Hospital, part of UHN, brought more COVID-19 patients back from the brink with extracorporeal membrane oxygenation (ECMO), a life-support apparatus similar to a heart-lung machine, than he had expected.

"We thought the whole system might be so overwhelmed that we wouldn't be doing much ECMO," he said. In Italy and China, "there were just so many hundreds of patients that they couldn't justify the extra human resources that were required to look after a patient on ECMO."

As of the end of July, TGH, which has the largest ECMO program in the province, had put 33 patients on ECMO who likely would have died otherwise. Sixteen of those patients have been

discharged alive from the ICU, while another two remain on ECMO.

Protecting hospital capacity did not come without costs. Seniors' facilities, which received far less political attention in the early days of the pandemic than hospitals, became mass-death sites, driving up Canada's COVID-19 mortality rate.

Operating rooms, meanwhile, sat idle – often needlessly in cities and regions without much COVID-19.

It's difficult to say exactly how many patients across the country had diagnostic or surgical procedures postponed, but a report from the Ontario government's Financial Accountability Office concluded that 52,700 hospital procedures had been avoided or cancelled as of the third week of April in that province alone.

As provincial health care systems have resumed elective surgeries, some, including B.C., have acknowledged it will take as long as two years to clear the backlog. "There's really no appetite to just stop everything again the way that we did last time," said Chris Simpson, a cardiologist and vice-dean of the medical school at Queen's University. "We suspect strongly that harm was done to patients by deferring some of this care."

Lesson four: To protect nursing homes, cut down on crowding

A woman tries to speak to her mother, through a window at Orchard Villa Care home, in Pickering, Ont. on April 25, 2020.

CHRIS YOUNG/THE CANADIAN PRESS

Of all Canada's failures in the first wave of the pandemic, the catastrophe in seniors' facilities is in an abominable league of its own. More than 80 per cent of the country's COVID-19 deaths were in nursing and retirement homes as of May 25, according to the Canadian Institute for Health Information and the National Institute on Ageing at Ryerson University.

In the worst outbreaks, even the survivors were neglected and ill-treated, with some left in soiled diapers in rooms full of cockroaches, according to reports from the Canadian military, which was called in to help at the worst-hit homes in Ontario and Quebec. Quebec has promised a public inquiry, and Ontario has launched an independent commission that is expected to report by next April.

So much went wrong in long-term care – a sector that was already the forgotten stepchild of Canadian health care – that it can be hard to determine which of the system's shortcomings did the most damage.

That's why Nathan Stall, a geriatrician at Toronto's Mount Sinai Hospital, and his fellow researchers analyzed how every nursing home in Ontario held up against the pandemic from March 29 to May 20. Their study of 623 homes, with more than 75,000 residents, found the coronavirus was likeliest to infiltrate homes in jurisdictions with plenty of community transmission.

Once the virus found its way in, it was likelier to spread more and kill more in for-profit nursing-home chains with pre-1972 design standards that allowed three or four residents to share a single room and bathroom, the study found.

Dr. Henry, the B.C. Provincial Health Officer, said the risk posed by shared accommodations is one of many long-simmering problems brought to a boil by the pandemic. Three-quarters of the beds in B.C.'s long-term care sector are in private rooms, she said – a higher, and safer, proportion than in Ontario and Quebec.

"We put our most vulnerable people together in rooms with other sick people or older people and we make them share a bathroom," she said, pointing out that hospitals with shared rooms have similar problems. "That is a recipe for infection-prevention-and-control disaster."

As Canada prepares for the second wave, it is trying to cut down on crowding in long-term care. Ontario, for example, has barred readmission or new admissions that would mean putting more than two people in a room. Hotels and retirement homes are being sized up as temporary accommodations for frail and elderly people with nowhere else to go until more homes can be built.

Other changes that helped tamp down nursing-home outbreaks, including prohibiting staff from working at more than one site, may have to stay in place for the duration of the pandemic to keep seniors safe. Improving the pay and working conditions in long-term care – where care aides used to work at multiple homes to eke out a living – could also help attract staff to a sector that has long struggled to attract workers.

“It’s COVID that unearthed these problems and brought them to the forefront, but these had been problems that we knew existed for a long time,” Dr. Henry said.

The same could be said of the broader societal ills laid bare by a virus that has disproportionately infected and killed vulnerable nursing-home residents, people living in poverty and racialized communities. Some of the most important lessons of COVID-19 should reverberate long after future waves of the pandemic subside.